CLAIMS

What is claimed is:

1. A process for brazing an aluminum surface comprising:

a. selecting a solid phase monolith or composite brazing composition comprising particles of corrosion protector for aluminum, filler material for brazing, brazing flux, or mixtures thereof;

b. introducing said brazing composition into a focused gas stream;

c. entraining said brazing composition in said gas stream;

d. accelerating said brazing composition toward said aluminum surface;

e. impacting continuously said brazing composition onto said aluminum surface to form a brazing composition, said brazing composition remaining in its original solid phase from said selection of said brazing composition to form said brazing composition on said aluminum surface.

2. The process of claim 1 wherein said brazing composition comprises a monolith of zinc, zinc-aluminum alloy, aluminum-silicon alloy, aluminum-zinc-silicon alloy or aluminum-zinc-silicon-copper alloy.

3. The process of claim 1 wherein said brazing composition comprises a composite selected from zinc, zinc-aluminum alloy, aluminum, silicon, aluminum-silicon alloy, aluminum-zinc-silicon alloy, and aluminum-zinc-silicon-copper alloy.

4. The substrate of claim 1, wherein said coating is mechanically applied to said aluminum surface by a process in which said pre-coating composition is accelerated in a gas stream traveling at a velocity of about 300 to about 1000 meters per second

5. The substrate of claim 1, wherein said gas stream is pre-heated up to a temperature of about 300°C.

6. The process of claim 2 wherein said brazing composition further comprises Nocolok® Flux.

7. The process of claim 3 wherein said brazing composition further comprises Nocolok® Flux.

8. A brazable aluminum substrate comprising an aluminum surface and a kinetically impinged coating bonded thereon, wherein said coating is a solid phase monolith or composite comprising corrosion protector for aluminum, filler material for brazing, brazing flux, or mixtures thereof, having at least one layer kinetically bonded to said aluminum surface that is substantially free of oxidation within said layer, and which substantially retains the same physical properties and solid phase as the original pre-coating composition.

9. The substrate of claim 8, wherein said coating is mechanically applied to said aluminum surface by a process in which said pre-coating composition is accelerated in a gas stream traveling at a velocity of about 300 to about 1000 meters per second

10. The substrate of claim 9, wherein said gas stream is pre-heated up to a temperature of about 300°C.

11. A brazable aluminum substrate of claim 8 wherein said brazing composition layer comprise a monolith of zinc, zinc-aluminum alloy, aluminum-silicon alloy, aluminum-zinc-silicon alloy, or aluminum-zinc-silicon-copper alloy.

12. A brazable aluminum substrate of claim 11 wherein said brazing composition layer further comprises Nocolok® Flux.

13. A brazable aluminum substrate of claim 8 wherein said brazing composition is a plurality of layers comprising a composite selected from zinc, zinc-aluminum alloy, aluminum, silicon, aluminum-silicon alloy, aluminum-zinc-silicon alloy, and aluminum-zinc-silicon-copper alloy.

14. A brazable aluminum substrate of claim 13 wherein said brazing composition layers further comprise Nocolok® Flux.

15. A method of brazing comprising:

providing a metal surface;

providing a brazing composition;

kinetically spraying said brazing composition onto said metal surface.

16. The method of claim 15, including providing a brazing composition comprising a corrosion protector material, brazing filler material flux material, or mixtures thereof.

17. The method of claim 16, wherein said metal surface is aluminum.

18. A method of fluxless, cladless brazing comprising:

providing a metal surface;

providing a brazing coating;

cleaning and deoxidizing said metal surface in a single kinetic spraying step that sprays said coating onto said metal surfaces.

19. The method of claim 18, wherein said brazing coating comprises both brazing flux and brazing filler.

20. A process for brazing a surface comprising:

a. selecting a solid phase monolith or composite brazing composition comprising particles of corrosion protector, filler material for brazing, brazing flux, or mixtures thereof;

b. introducing said brazing composition into a focused gas stream;

c. entraining said brazing composition in said gas stream;

d. accelerating said brazing composition toward said surface;

e. impacting continuously said brazing composition onto said surface to form a brazing composition, said brazing composition remaining in its original solid phase from said selection of said brazing composition to form said brazing composition on said surface.

21. A brazable substrate comprising a metal surface and a kinetically impinged coating bonded thereon, wherein said coating is a solid phase monolith or composite comprising corrosion protector for said metal, filler material for brazing, brazing flux, or mixtures thereof, having at least one layer kinetically bonded to said metal surface that is substantially free of oxidation within said layer, and which substantially retains the same physical properties and solid phase as the original pre-coating composition.

22. The substrate of claim 21 wherein said coating is mechanically applied to said aluminum surface by a process in which said pre-coating composition is accelerated in a gas stream traveling at a velocity of about 300 to about 1000 meters per second.

23. The substrate of claim 22, wherein said gas stream is pre-heated up to a temperature of about 300°C.

24. A process for brazing a metal surface comprising:

a. selecting a solid phase monolith or composite brazing composition comprising particles of corrosion protector for metal, filler material for brazing, brazing flux, or mixtures thereof;

b. introducing said brazing composition into a focused gas stream pre-heated to a temperature sufficient low to maintain said particles in their original solid phase;

c. entraining said brazing composition in said gas stream;

d. accelerating said brazing composition toward said metal surface;

e. impacting continuously said brazing composition onto said metal surface to form a brazing composition, said brazing composition remaining in its original solid phase from said selection of said brazing composition to form said brazing composition on said metal surface.

25. A process for brazing a metal surface comprising:

a. selecting a solid phase monolith or composite brazing composition comprising particles of corrosion protector for metal, filler material for brazing, brazing flux, or mixtures thereof;

b. introducing said brazing composition into a focused gas stream;

c. entraining said brazing composition in said gas stream;

d. accelerating said brazing composition toward said metal surface at a velocity sufficient to fracture a surface oxide layer and form a mechanical bond between said particles and said metal surface;

e. impacting continuously said brazing composition onto said metal surface to form a brazing composition, said brazing composition remaining in its original

solid phase from said selection of said brazing composition to form said brazing composition on said metal surface.